

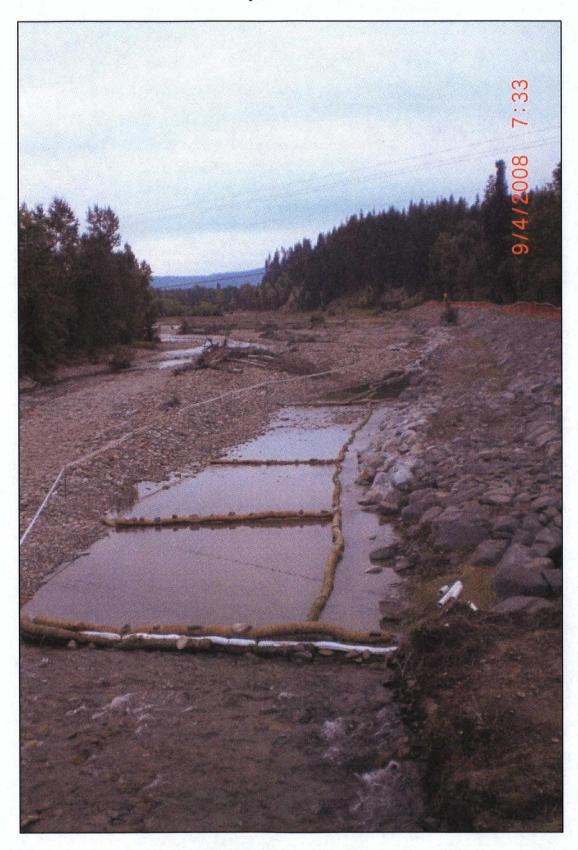
Granite Creek Remediation September 2008





Granite Creek Remediation

September 2008



SHOTCRETE / SPECSHOT / SPECNAIL / SPECPATCH / SPECPOOL / SPECFINISH

i of 6

MATERIAL SAFETY DATA SHEET

(Complies with OSHA CFR 1910.1200 ANSI Z 400.1-1998)

SECTION 1: Chemical Product and Company Identification

Product Name: SPEC MIX® Shotcrete

Manufacturer Name and Address:

SPEC MIX®

2025 Centre Pointe Blvd., Suite 150 Mendota Heights, MN 55120

Telephone Contact Number and Hours of Operation: (888) 773-2649; 8:00 a.m. - 4:00 p.m. Central Time

Emergency Telephone Contact Number: (800) 854-7820

SECTION 2: Composition/information on ingredients

Hazardous Ingredients (*) Portland cement	<u>CAS No.</u> 65997-15-1	OSHA 15mg/m ³ (1) 5mg/m ³ (2)	PEL NE NE	<u>AC GiH</u> 10mg/m ³ N E	<u>TLV</u> NE NE
Silica Fume Crystalline silica (sand and gravel)	14808-60-7 s	ee 29 CFR 1910.1000 table z-3	142	0.05 mg/m ³⁽³⁾	NE
Calcium sulfate	7778-18-9	15mg/m ³ (1) 5mg/m ³ (2)	NE	10mg/ m ³	NE
May also contain trace amounts of: Chromium oxide	1308-38- 9	0.5mg/m ³⁽⁴⁾	NE	0.5mg/m ³⁽³⁾	NE

- 1- PNOC (Particulate not otherwise classified) as total dust
- 2- PNOC as respirable fraction
- 3- As respirable fraction
- 4- Chromium (III) compounds as chromium

*All ingredients in quantities > 1.0% (0.1% for carcinogens) that are potentially hazardous per OSHA definitions NDA = no data available NE = not established

Some states enforce the PELs that OSHA promulgated in 1989, which were subsequently vacated by the U.S. Supreme Court. Check with your state OSHA agency to determine which PEL is enforced in your jurisdiction.

SECTION 3: Hazards Identification

EMERGENCY OVERVIEW

Physical description: Natural gray solid

Odor: None

<u>Potential Health Effects:</u> Warning! Contact with wet concrete can burn eyes and skin. Permanent eye damage can result from eye contact. Dust from the dry material can cause severe irritation and possibly burns to the eyes and respiratory tract with coughing and nasal discharge. Lung damage and possibly pulmonary edema can result from dust exposure. Skin contact may not cause in immediate burning sensation. It is important to begin skin first-aid even if there is no immediate burning sensation. Repeated or prolonged skin contact may cause skin allergic reactions. Personnel responding to a spill of this material should wear appropriate personal protective equipment.



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2 of 6

Fire Hazards:

NFPA Ratings: Health = 2 Fire = 0

Reactivity = 0

Special = NDA

HMIS Ratings: Health = 2

Fire = 0

Reactivity = 0

Protective Equipment = X

SECTION 4: First Aid Measures

Note: Signs and symptoms of skin burns may be delayed. Begin first aid immediately following skin contact even if there is no immediate burning sensation.

Eye Contact: Hold eye open and rinse slowly and gently with water for 30 minutes. Remove any contact lenses (if easy to do), after the first 5 minutes then continue rinsing the eye. Get medical attention immediately.

Skin Contact: Flush affected area for 20 minutes then wash affected area with mild soap and water. Get medical attention immediately.

Ingestion: Get medical attention immediately. Immediately rinse mouth with plenty of water. Have person sip a glass of water if able to swallow — **NEVER** give anything by mouth to an unconscious person. Do not induce vomiting. Inhalation: Remove to fresh air. Seek medical attention immediately if breathing becomes difficult.

SECTION 5; Fire Fighting Measures

Extinguishing media: Noncombustible. Use media suitable for surrounding fire.

Flashpoint: NDA

Hazardous products of combustion: Calcium oxide fumes.

Autoignition temperature: NDA

Flammable limits: LEL;NDA UEL; NDA

Unusual fire and explosion hazards: None known.

Protective equipment: Use NIOSH/MSHA approved SCBA and bunker gear.

SECTION 6: Accidental Release Measures

Do not attempt to clean up chemical spills without appropriate personal protective equipment (see section 8). For a spill of the dry material, use a HEPA (high efficiency particle air) vacuum to collect material and place in seal able containers for disposal. For a wet spill, absorb or cover with dry earth, sand or other noncombustible material and transfer to containers for disposal. Neutralize spill area. Use materials that can withstand the potentially corrosive nature of this product. Do not get water inside containers. See Disposal Comments in Section 13.

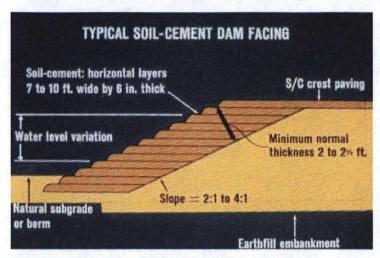
SECTION 7: Handling and Storing

Handling: Avoid contact with eyes and skin. Avoid generating and breathing dusts. Dust may be generated from cutting, grinding, drilling, sawing, or otherwise disturbing hardened concrete. Use with proper personal protective equipment (see Section 8).

Storage: Store upright in a cool, dry, well-ventilated area out of direct sunlight. Protect containers from physical damage. Do not roll containers. Keep containers tightly closed at all times. Do not reuse container. Store away from incompatible materials (see Section 10). Keep out of reach of children.

Embankment Slope Protection

Water Resources Home > Soil Cement > Embankment Slope ProtectionThe typical design section used for slope protection depends on the severity of its intended application. For slopes exposed to moderate-to-severe wave action the soil-cement is usually placed in successive horizontal layers 6 ft to 9 ft wide and 6 in. to 9 in. thick adjacent to the slope. This is referred to as "stairstep" slope protection. The "steps" that are created help to dissipate the energy in the waves and reduce the height of the wave runup.



For less severe applications, slope protection may consist of a 6 in. to 12 in. thick layer of soil-cement placed parallel to the slope face. This method, referred to as "plating," uses a lot less soil-cement than the stairstep method but cannot be successfully placed on slopes steeper than 2.5:1 and provides little resistance to wave runup.

The largest soil-cement project worldwide involved 1.2 million cu yd of soil-cement slope protection for a 7,000 acre cooling water reservoir at the South Texas Nuclear Power Plant near Houston. Completed in 1979, the 39 ft to 52 ft high embankment was designed to contain a 15 ft high wave action created by hurricane force winds. The main embankment was 13 miles long and had another 7 miles of interior dikes.

Florida Power and Light in South Florida created a cooling reservoir from an old phosphate pit in 1998. The 30,000 ft long embankment was designed with riprap slope protection, but the contractor submitted a value engineering proposal to change the rock riprap to soil-cement. The contractor placed 80,000 cu yd of soil-

cement using the platting method on slopes that varied from 3:1 to 5:1. The contractor utilized a paving machine to place all the soil-cement. Serrations were made in the soil-cement near the top of the embankment to increase the roughness and reduce wave runup.

Soil-cement was used in 2001 to rehabilitate the slope protection at Jackson Lake Dam east of Denver, Colorado. The fine grain silts and sands from the reservoir were used to produce the soil-cement. The project was bid with two options for horizontal width: 6 ft or 8 ft. As mentioned earlier, an 8 ft width is usually specified because that is the minimum width on which trucks can operate. Widths narrower than 8 ft have been found to be uneconomical even through less soil-cement is used. The contractor

was able to develop a delivery system of trucks and a track excavator to place the soil-cement on the horizontal lifts. The only equipment operated on the lift were a small dozer and a smooth drum vibratory roller, which could operate on a 6 ft wide surface. The contractor placed 130,000 cu yd along the 3,000 ft long dam.



Bank Protection/Levees

Building on the success of soil-cement for slope protection for wave action, engineers transferred this knowledge to protecting streambanks from lateral erosion during flood events. The success of soil-cement in this application was demonstrated during two significant flood events in Tucson, Arizona, in 1983 and 1993. Even though overtopped, the soil-cement bank protection prevented millions of dollars in property damage. In Tucson more than 74 miles of streams, rivers, and

washes are now protected with soil-cement.

A typical section consists of 8 ft to 9 ft wide horizontal layers placed in stairstep fashion along 1:1 stream bank slopes. If the design calls for a "soft" bottom the soil-cement is carried before the existing channel invert



elevation to a depth equal to the maximum scour depth that could be expected over the life of the project. At the terminus of the soil-cement reach, the soil-cement protection is turned perpendicular to the channel into the banks approximately 50 ft to prevent head-cutting erosion from occurring behind the soil-cement.

The exposed slope facing can be trimmed "smooth," left natural with

loose overbuild soil-cement remaining in place, or rough steps can be created without any formwork. To withstand the abrasive force of stormwater flows at velocities up to 20 ft/sec, the soil-cement is typically designed for a minimum 7-day compressive strength of 750 psi. Some designers who use fly ash in the soil-cement may use a 28-day

requirement for compressive strength.



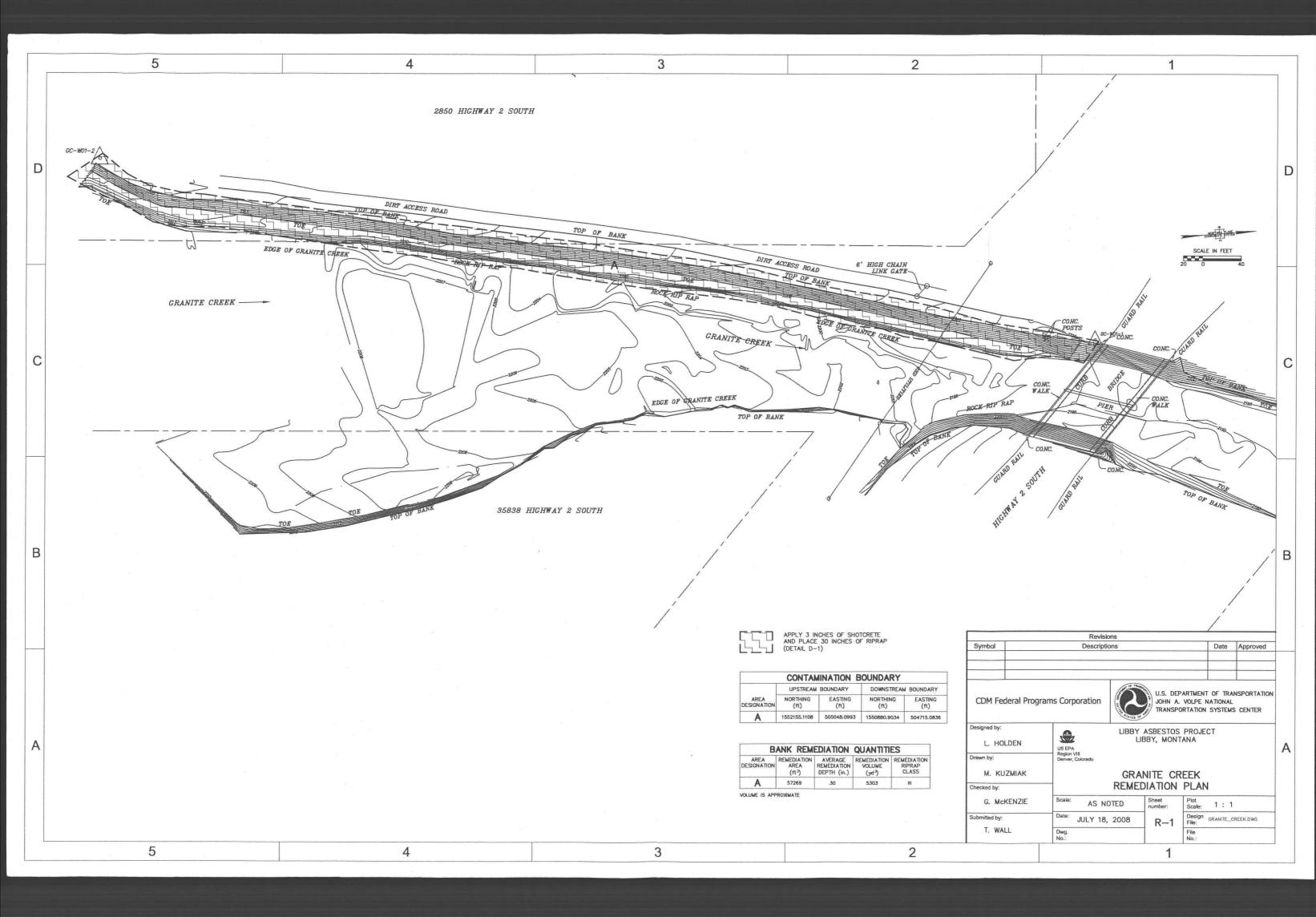


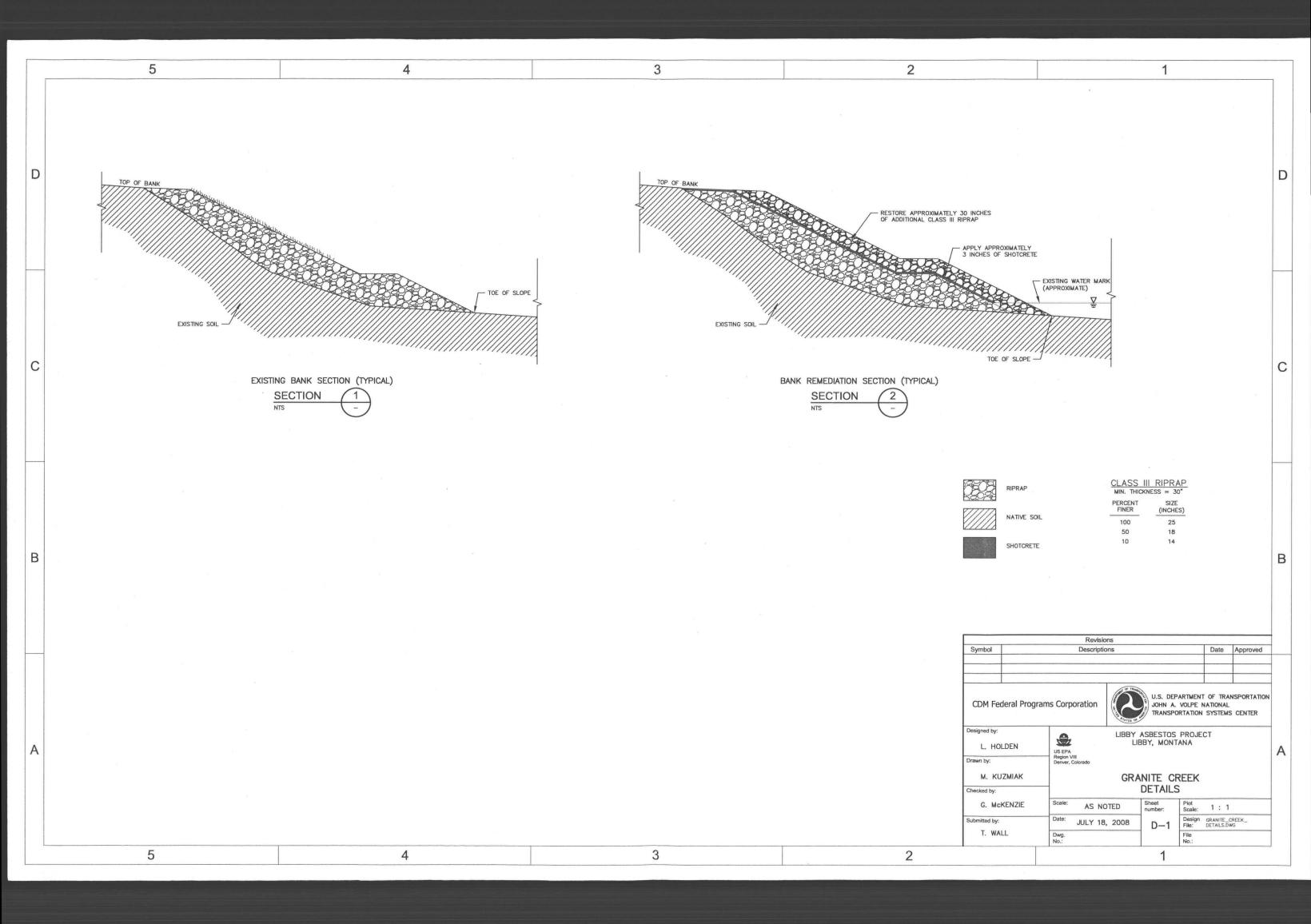


In Albuquerque, New Mexico, soil-cement was used on both the San Antonio and the Calabacillas arroyos where sensitivity to the environment was an important consideration. Special artwork was used at Calabacillas. Colored shotcrete was used above the soil-cement, and precast dinosaur bones were placed into the shotcrete. The side slopes at Calabacillas and San Antonio arroyos were stepped to both provide east exit from the channel and to mimic a layered stone formation.

A soil-cement protected levee was constructed at Camp Pendleton to protect the airfield. This approximately 2 mile long levee used over 150,000 cu yd of soil-cement, with the soil coming from the banks of the Santa Margarita River.

The Los Angeles District of the U.S. Army Corps of Engineers designed soil-cement bank protection along a reach of the Santa Ana River in Norco, California. The river was encroaching onto a residential area located on top of a bluff.





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GENERAL NOTES:

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- 1. THE 'CONTRACT DOCUMENTS', REFERENCED HEREIN, INCLUDE THE DESIGN ANALYSIS REPORT (DAR), THE RESPONSE ACTION WORK PLAN (RAWP) WITH APPLICABLE ADDENDA, SPECIFICATIONS AND DRAWNGS. THESE DOCUMENTS SHALL BE PROVIDED TO THE CONTRACTOR BY THE GOVERNMENT.
- 2. THE CONTRACTOR SHALL PERFORM THE WORK WHILE MINIMIZING ENVIRONMENTAL POLLUTION AND DAMAGE AS THE RESULT OF CONSTRUCTION OPERATIONS. THE ENVIRONMENTAL RESOURCES WITHIN THE PROJECT BOUNDARIES AND THOSE AFFECTED OUTSIDE THE CONSTRUCTION LIMITS SHALL BE PROTECTED DURING THE ENTIRE DURATION OF THIS PROJECT.
- 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM SECURITY TO SECURE THE WORK AREA, AS WELL AS THE CONTRACTOR'S FACILITIES AND EQUIPMENT WITHIN THE LIMITS OF THIS CONTRACT.
- 4. TOPOGRAPHIC SURVEYS WERE PERFORMED BY J.R.S. SURVEYING, INC. OF BONNERS FERRY, IDAHO. HORIZONTAL POSITION OF THE SURVEY IS BASED ON MONTANA STATE PLANE COORDINATE SYSTEM, LAMBERT CONFORMAL CONIC PROJECTION, NAD1983 (CONUS). SURVEYED ELEVATIONS AREA BASED ON THE NAVD88 DATUM. SURVEYED PLANS INCLUDE PROPERTY BOUNDARIES AND/OR DETAILS FOR THE EXCAVATION AREAS ONLY. SURVEYED DRAWINGS ARE NOT WARRANTED TO BE COMPLETE, BUT ARE SUITABLE FOR CONSTRUCTION PLANNING PURPOSES.
- 5. THE CONTRACTOR IS RESPONSIBLE FOR ALL PROJECT SAFETY AS DETAILED IN THE GOVERNMENT APPROVED SITE HEALTH AND SAFETY PLAN.
- 6. THE GOVERNMENT WILL OBTAIN AGREEMENTS NECESSARY TO ACCESS PROPERTIES. THE CONTRACTOR IS NOT ALLOWED TO PERFORM WORK ON ANY PROPERTY WITHOUT AN ACCESS AGREEMENT.
- 7. THE CONTRACTOR SHALL HAVE A COPY OF THE PROJECT DOCUMENTS AT THE WORK AREAS AT ALL TIMES.
- 8. THE CONTRACTOR SHALL USE CONSTRUCTION EQUIPMENT THAT IS SUITABLE FOR USE IN A RESIDENTIAL SETTING. THE CONSTRUCTION EQUIPMENT SHALL BE IN GOOD WORKING ORDER AND SHALL BE EQUIPPED TO MEET THE NOISE REDUCTION REQUIREMENTS SPECIFIED IN THE CONTRACT DOCUMENTS.
- 9. NOTES INCLUDED HERE APPLY TO ALL SHEETS UNLESS OTHERWISE NOTED. REFER TO CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION.

5

REMEDIATION NOTES:

- 1. THE CONTRACTOR SHALL INSTALL AND MAINTAIN APPROPRIATE EROSION AND SEDIMENT CONTROLS (I.E. SILT FENCES, TEMPORARY WATER RETENTION BERMS, EROSION CONTROL MATS) PRIOR TO COMMENCEMENT AND THROUGHOUT THE DURATION OF THE CONSTRUCTION ACTIVITIES. INSTALLATION AND MAINTENANCE SHALL MEET THE MINIMUM REQUIREMENTS ESTABLISHED IN THE CONTRACT DOCUMENTS.
- 2. THE CONTRACTOR SHALL PERFORM ALL SITE PREPARATION AND DECONTAMINATION ACTIVITIES PRIOR TO REMEDIATION ACTIVITIES.
- 3. THE REMOVAL CONTRACTOR WILL PROVIDE THE WATER SOURCE FOR PERSONNEL AND EQUIPMENT DECONTAMINATION. DECONTAMINATION WATER WILL BE CAPTURED AND DISPOSED OF PROPERLY.
- 4. THE CONTRACTOR SHALL DETERMINE THE MOST APPROPRIATE METHOD OF ACCESSING THE EXCAVATION AREAS, AND SHALL RESTORE ACCESS AREAS TO THEIR ORIGINAL CONDITION. THIS INCLUDES, BUT IS NOT LIMITED TO, DRIVEWAYS, YARD AREAS, AND FENCES.
- 5. THE APPROXIMATE LOCATION OF CONTAMINATED MATERIAL (AREA A) SHOWN ON THE CONTRACT DRAWINGS DEFINES THE BOUNDARY WHERE RIPRAP CONTAINING LIBBY AMPHIBOLE WAS REPORTED. DURING REMEDIATION ACTIVITIES DEFINED BOUNDARIES ARE SUBJECT TO ADJUSTMENT UPON INSPECTION BY A GOVERNMENT REPRESENTATIVE.
- 6. THE CONTRACTOR SHALL ENCAPUSLATE THE IDENTIFIED CONTAMINATED RIPRAP, AS DIRECTED BY THE GOVERNMENT REPRESENTATIVE.
- 7. ENCAPSULATION OF CONTAMINATED MATERIAL OUTSIDE OF THE DEFINED BOUNDARY MAY BE REQUIRED AS DETERMINED BY VISUAL INSPECTION CONDUCTED DURING EXCAVATION ACTIVITIES. VISUAL INSPECTIONS SHALL BE CONDUCTED BY THE GOVERNMENT REPRESENTATIVE.
- 8. ALL MOVEABLE SITE FIXTURES SHALL EITHER BE DISMANTLED/REMOVED, DISPOSED OF, AND REPLACED; OR REMOVED, DECONTAMINATED, AND TEMPORARILY RELOCATED FROM THE INITIAL EXCLUSION ZONE, UNLESS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS. SITE FIXTURES THAT ARE NOT MOVEABLE SHALL BE PROTECTED IN-PLACE.

- 9. ADDITIONAL SITE FIXTURES MAY REQUIRE PROTECTION OR REMOVAL IF REMEDIATION EXTENDS BEYOND THE INITIAL REMEDIATION LIMITS OR IF THE GOVERNMENT REPRESENTATIVE IDENTIFIES ADDITIONAL SITE FIXTURES DURING CONSTRUCTION. REMOVAL, DISPOSAL, DECONTAMINATION, AND STORAGE OF ANY ADDITIONAL FIXTURES ENCOUNTERED DURING CONSTRUCTION, WHICH MAY OR MAY NOT BE IDENTIFIED ON THE CONTRACT DRAWINGS, SHALL BE HANDLED IN ACCORDANCE WITH THE DESIGN CRITERIA ESTABLISHED IN THE CONTRACT DOCUMENTS.
- 10. CONTAMINATED EMBANKMENT AREAS WILL BE REMEDIATED WITH SHOTCHETE AND RIPRAP MATERIAL, AS DESIGNATED ON THE DETAIL DRAWING.
- 11. GRUBBING AND DISPOSAL OF BRANCHES AND SHRUBS WILL TAKE PLACE BEFORE APPLICATION OF SHOTCRETE.
- 12. ENCAPSULATE EXISTING RIPRAP WITH APPROXIMATELY 3 INCHES OF SHOTCRETE. FILLING VOIDS BETWEEN BOULDERS IS NOT REQUIRED. THE VOLUME OF SHOTCTERE NEEDED IS APPROXIMATELY 0.3 CY/YD2. REMEDIATION RIPRAP SHOULD BE PLACED BEFORE THE SHOTCRETE IS ALLOWED TO SET.
- 13. REMEDIATION RIPRAP SHALL BE PLACED STARTING FROM THE TOE OF THE SLOPE TOWARDS TOP OF BANK.
- 14. REMEDIATION MATERIALS WHICH DO NOT MEET THE APPROVAL OF THE GOVERNMENT REPRESENTATIVE, AS DETERMINED BY THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, ARE SUBJECT TO REPLACEMENT AND REINSTALLATION BY THE CONTRACTOR.
- 15. THE CONTRACTOR SHALL RESTORE ALL TEMPORARILY DISPLACED SITE FIXTURES TO THEIR ORIGINAL LOCATIONS, AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. ANY SITE FIXTURES SPECIFIED TO BE REPLACED ON THE CONTRACT DRAWINGS SHALL BE REPLACED IN—KIND.

BEST MANAGEMENT PRACTICE NOTES:

- 1. EQUIPMENT USED NEAR THE WATER WILL BE CLEANED PRIOR TO CONSTRUCTION.
- 2. WORK WILL BE CONDUCTED DURING A PERIOD OF LOW FLOW.
- 3. BIODEGRADABLE HYDRAULIC FLUIDS WILL BE USED IN MACHINERY WHERE APPROPRIATE.
- 4. REFUELING WILL OCCUR ON THE BACKSIDE OF THE LEVEE OR ON ESTABLISHED STAGING AREAS.
- 5. CONSTRUCTION EQUIPMENT SHALL BE REGULARILY CHECKED FOR DRIPS OR LEAKS.
- 6. AT LEAST ONE FUEL SPILL KIT WITH ABSORBENT PADS WILL BE ONSITE AT ALL TIMES.
- 7. DRIVE TRAINS OF EQUIPMENT WILL NOT OPERATE IN THE WATER.

